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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/584,921

06/29/2006

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4662-212

1327

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7590

05/28/2009

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EXAMINER

INYARD, APRIL C

ART UNIT

PAPER NUMBER

1794

MAIL DATE

DELIVERY MODE

05/28/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/584,921	Applicant(s) MUTSAERS ET AL.	
	Examiner APRIL C. INYARD	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/26/2006</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

The present application is recognized as the US national stage entry of PCT/EP05/00442, filed 01/13/2005, and claims foreign priority to application EP04075123.2, filed 01/13/2004.

Claims 1-10 are pending and have been considered as follows:

Claim Objections

1. Claim 8 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

MPEP 608.01(n) states:

The test as to whether a claim is a proper dependent claim is that it shall include every limitation of the claim from which it depends (35 U.S.C. 112, fourth paragraph) or in other words that it shall not conceivably be infringed by anything which would not also infringe the basic claim.

Claim 8 can be infringed without infringing claim 1 because claim 8 claims a food product “obtainable” by the process of claim 1. A food product could be made by a materially different process, but it would still infringe claim 8 if it is conceivable that the food product could be made by the process of claim 1.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. **Claims 2 and 7 and 9-10** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 2 recites the broad recitation flour, and the claim also recites "preferably wheat flour" which is the narrower statement of the range/limitation. Likewise, claim 7 recites the broad recitation fungus belonging to the genus *Marasmius*, and the claim also recites "preferably *Marasmius scorodonius*" which is the narrower statement of the range/limitation.

5. Claims 9-10 provide for the use of enzymes, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

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Claim Rejections - 35 USC § 101

6. *35 U.S.C. 101 reads as follows:*

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 9-10 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. **Claims 1-2, 4 and 8-9 are rejected under 35 U.S.C. 102(b) as being anticipated by**

Haas (US Pat No 1,957,335):

Haas teaches that unbleached flour has a characteristic yellowish color due to the present of carotin pigment, and further discloses a process of bleaching/decolorizing the carotin pigment

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of the flour by adding a soybean derived bleaching agent enzyme (*p. 2, lines 15-74*), where the flour bleached by the enzyme is wheat flour (*p. 2, line 55*).

The Examiner notes that the carotin pigment taught by Haas is a carotenoid.

Therefore regarding **Claims 1-2, 4, and 8-9**, Haas teaches a process for the production of a naturally bio-based bleached wheat flour (food product) involving the step of adding at least one enzyme that directly converts the yellowish carotin pigment (carotenoid) present in wheat flour into a decolorized form and thus increases the whiteness of the food product. Thus Haas further discloses a process, food product, and use of an enzyme as presently claimed.

9. Claims 1-2, 4-6, and 8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Sugio et al. (WO 2002/086114):

Sugio discloses a lipoxygenase enzyme derived from a filamentous fungus and a process whereby the enzyme is added to a food material containing carotenoid such as flour for bread and noodles or fish meat is to produce a bleached product or to a detergent as a bleaching agent, as the fungally derived enzyme is a powerful oxidant of carotenoid pigments (*Abstract; p. 4, lines 9-37; Bleaching assay, p. 9, lines 20-28; Bleaching effect, Example 5, p. 13, β -carotene; Claims 11-13*).

The Examiner considers the flour of Sugio to read on any flour used in making dough, including wheat-based flour.

Sugio discloses derivation and preparation of the lipoxygenase enzyme directly from filamentous fungi, microorganisms that product the enzyme (*Examples; p. 2, lines 20-30; Claims*).

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Therefore, regarding **Claims 1-2, 4-6, and 8-9**, Sugio discloses a process for the production of a food product which comprises adding an enzyme effective in bleaching carotenoid pigments, wherein the food product includes flour and dough and results in increased whiteness of the resulting food product, and the enzyme is derived from filamentous fungus.

Regarding **Claim 10**, Sugio further discloses use of the enzymes in detergents (*p. 4, lines 35-37*).

10. Claims 1, 3-6, and 8-9 are rejected under 35 U.S.C. 102(e) as being anticipated by Roos et al. (WO 2005/004616, US Effective Filing Date of July 1, 2004; publication date of January 20, 2005).

The applied reference has a common Inventor and Assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

Roos discloses a process for bleaching of dairy products by adding a lipoxxygenase enzyme to decolorize β -carotene (carotenoid) pigments contained in the raw product, where the enzymes are preferably derived from microorganisms including fungus. (*Abstract; p. 2, lines 23-33; p. 3, whole page*).

Therefore, Roos teaches a process, food product, and use of an enzyme that meets the limitations of Claims 1, 3-6, and 8-9.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. **Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sugio in view of Zorn (*Appl. Microbiol. Biotechnol.*, 62:331-336, 2003).**

As discussed above, Sugio teaches a process that meets the limitations of Claim 1, wherein a lipoxygenase enzyme derived from a filamentous fungus is used as a bleaching agent in food products and detergents.

Sugio discloses that the carotenoid cleaving (bleaching) enzyme is derived from the fungus belonging to the phylum Ascomycota, and genus *Magnaporthe*.

Sugio fails to specifically teach derivation of a carotenoid cleaving (bleaching) enzyme from a fungus belonging to the genus *Marasmius*.

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However, Zorn discloses derivation of enzymes from the *Marasmius scorodoni*, a white-rot basidiomycete fungus (*Abstract; Introduction*), and teaches a process whereby the enzymatic activity is measured by the degradation of β -carotene through a photometric bleaching test (*Methods—Screening and Enzyme Assay; Table 2*).

The Examiner notes that as disclosed by Zorn, the degradation of β -carotene and thus bleaching activity of enzymes derived from *M. scorodoni* appears to be greater and more powerful than enzymes derived from other fungi including a representative fungus of the phylum, Ascomycota (*Table 2*).

It would have therefore been obvious at the time the invention was made to one having ordinary skill in the art to modify the process of Sugio through simple substitution of one known carotenoid cleaving (bleaching) enzyme derived from fungus for another as known functional equivalents as taught by Zorn because enzymes derived from *M. scorodoni* are amongst the most enzymatically active in cleaving β -carotene as compared with other fungally derived enzymes and would yield the predictable result of potently whitening and bleaching carotenoid pigments in a food product.

Substitution of functional equivalents requires no express motivation as long as the prior art recognizes the functional equivalency. In the instant case, enzymes derived from the fungus *Magnaporthe* and *Marasmius* are functional equivalents in the field of carotenoid cleaving enzymes. *In re Fount* 213 USPQ 532 (CCPA 1982); *In re Sienbentritt* 152 USPQ 618 (CCPA 1967); *Graver Tank & Mfg. Co. Inc. v. Linde Air Products Co.* 85 USPQ 328 (USSC 1950).

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Efthymiou (US 3843801) discloses the production of cheese wherein the final product may be bleached for consumer acceptability (see entire patent, especially column 7, lines 3-11).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to APRIL C. INYARD whose telephone number is (571) 270-1245. The examiner can normally be reached on Monday - Thursday 8:00 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Sample can be reached on (571) 272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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/David R. Sample/
Supervisory Patent Examiner, Art Unit 1794

APRIL C INYARD /A. C. I./
Examiner, Art Unit 1794